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Contents copyrighted, 1957, by the Systems and Procedures Association of America

The role of systems men is to lead--not follow;
today management needs systems men more than ever before

The Importance of Systems Men

► Modern industrial management is growing steadily more and more complex. We have seen within the last few decades, the creation and rise to professional status of such tools of modern management as Industrial Relations, Public Relations, Industrial Engineering, and, of course, Systems and Procedures.

Since the normal expansion of industry has created these and other marvelous tools of scientific management to fulfill a need, it is safe to predict that the continuing industrial expansion of the atomic age will pose even greater problems than ever before. The increasing complexity of our organizations enhances the importance of good systems. The extensive use of digital computers, magnetic memory drums, punched card systems, and other modern control devices requires a higher grade of Systems and Procedures Engineer than ever before. A constant reappraisal of systems, procedures, techniques and business habits is mandatory.

For scientific management to function properly, all parts of our organizations must be coordinated and the proper atmosphere and environment maintained for maximum realization of effort.

"Systems" are the means by which the personnel of a company operate to accomplish the objectives of the company. They are the means of translating the policies of management into action.

"Procedures" are the written and oral instructions implementing and making legal a "system." Procedures in small organizations are often oral and informal. In large organizations they are written, graphically charted and approved by management.

The systems man's chief characteristics are imagination, enthusiasm, energy, training, experience and the ability through an ordered, logical approach to detect and define basic principles in seeming complexity.

His position in the company is to act as a consultant in a staff capacity and assist the line organization in its job of attaining objectives. As a staff man he must obtain information from other places, from his own experience and from objective study

Q. G. Turner has been manager of administrative services for Convair Pomona since 1951. He has successfully conducted his own consulting engineering firm and was formerly factory supervisor and equipment and methods manager for Vega Aircraft.

by D. G. Turner

No factor is more important in the establishment of an effective Systems and Procedures Department than the judicious choice of personnel. One of the keenest systems analysts I have known, states that the qualifications for the successful systems man are, briefly:

Superior mentality. The successful systems man must possess an analytical mind enabling him to penetrate through the complexities of a problem to its essential elements. His mind must automatically eliminate all superfluous factors from consideration. Having penetrated to the essential elements of a problem, he must be capable of reasoning logically and quickly, understanding the relationships of cause and effect. He must be able to see things in a broad prospective.

Imagination. He must possess the imagination and resourcefulness to strike out in the field of new methods, to envisage untried procedures as future possibilities, and to present them in a convincing manner.

Attitudes. The systems man must always be objective in his thinking, unbiased in his opinions, his mind must be open, ready to be logically convinced of the best answer. He must be skeptical, critical and eternally curious. He must have a naturally inquisitive instinct and desire for knowledge. He must be honest with himself in that he will not delude himself into thinking that his own proposals are necessarily superior to others; be honest with others, in that he will willingly give credit to others whose thinking has contributed towards the perfection of the system which he is presenting.

Skills. The systems man must possess to a high degree the ability to express himself clearly, orally, in writing, and graphically. He must be skilled in the language arts, be aware of subtle differences in the meaning of words, and know how to express

of current problems, and pass this information on to the line organization.

Coordination of interdepartmental matters is a prime function of a good systems man. He must have the *respect* of the workers, the supervisors and the top management with whom he works. Without this, he is lost. The ability to meet, converse, discuss and plan and sell ideas to all levels of an organization is required. He is not "thin skinned." Ideally, the systems man should be of the sales engineer type with the ability to sell his product and keep it sold. A systems man who is not respected or not well thought of by the line personnel with whom he comes in contact will give the entire department a bad reputation.

Comparisons

His job is to make studies and comparisons which contribute to the successful administration of the business, and to base recommendations and proposals on statistics, facts and good sound judgment.

The modern "systems" man is self-effacing. He does not gather "glory" for himself. He gets the effected people in the act early and gives the "glory" to others to sell. He does not attempt to be an administrator, rather he deals in operating methods and practices, and is of direct assistance to line people and departments.

Continued

complicated thoughts in clear and basic English. Since a graphic analysis and presentation of complex ideas can most often clearly summarize many written pages, the superior systems man will be skilled in the graphic arts.

Personality. The systems man must understand the psychology of human behavior. He must sympathize with others' problems, and possess the tact necessary to convince effectively without appearing to force his ideas upon others. He must take his work seriously yet not lose his sense of humor. Finally, he must possess the drive to enable him to continue in his work despite discouragements, defeats and necessary compromises.

Loyalty. The systems man in a defense industry is in a vital position. His work demands that he know and handle a large volume of highly classified material, and that he alone may be responsible for its security. No man, no matter how otherwise qualified for the position, should engage in systems analysis until he has been unquestionably cleared for security as high as the material he is to handle. Once engaged in systems work, he must be constantly vigilant that the data in his possession is not compromised.

The Systems Man's Modus Operandi. The systems man must educate—cooperate—participate—communicate.

He must *educate* himself in the detailed techniques of the business and organization with which he is associated. He must constantly develop his skills and increase his knowledge of scientific management tools. He must acquire an excellent overall knowledge of the job.

He must *cooperate* fully with line supervision, with top management and with other staff personnel. The line departments have the responsibility and the authority to perform their respective functions. The cooperative and continual efforts of the systems man will help keep the responsibilities and authority for operating the business where it belongs. He must never assume a line function.

He must *participate* in company activities, in departmental meetings, on committees and in conferences. He cannot sit in an "ivory tower" and develop the perfect system in solitary seclusion. He must participate also in an exchange of ideas with other systems men, by means of visits to other plants, membership in technical societies such as this one, and a constant review of technical and scientific management literature.

He must *communicate* his ideas, his findings, his compilations of information clearly and concisely.

The results of the systems man's efforts, if communicated properly, will provide management with the information on which may be based the calm and considered opinion and the sound actions essential to the success of the organization.

Translate Decisions

The systems man must *analyze* company policy decisions and translate them into acceptable systems and procedures, which will communicate these policies clearly and concisely to all personnel and departments concerned.

He must *initiate* new systems through consultation with management for the accomplishment of the organization's overall objectives, and *write*, *chart* and *sell* the explicit procedures for their accomplishment.

He must *investigate* existing systems and procedures in order to improve them by elimination of duplication of effort, unnecessary steps, misplaced functions and responsibility without authority.

He must *design* the forms used to implement a system and review these forms

periodically to obtain the highest efficiency in the operation of the system.

He must prepare and maintain organization and functional charts showing lines of authority and delineation of functions, and he must disseminate procedures throughout the company by means of printed standard practices, procedures and reports, and brochures.

To be most effective, the Systems and Procedures Department should report directly to the top executive of the organization. The systems man must have the freedom to operate at all levels of supervision and across all departmental lines. This is why he must, of necessity, always operate in a staff capacity and not report to a line executive. If the Systems and Procedures group is buried in a line department such as Accounting, Engineering or Plant Engineering, it is impossible for the systems man to maintain a vitally important impartiality, and an unbiased approach to all problems. The tendency in many industrial companies today is for Systems and Procedures to be the solid cornerstone of an Industrial Engineering department, which in turn reports directly to the top executive. Other functions of a typical Industrial Engineering department are, Organization Control, Cost Reduction activities such as Employee Suggestion programs, Work Simplification programs and Material Conservation programs. Still other functions in Industrial Engineering are Factory Methods, Time Study, Plant Layout and Expenditure Control. Now all these functions are interrelated, closely allied to Systems and Procedures, and should be staff operations rendering a company-wide service to top management and to all line departments.

To prosper and to reward the company properly, the Industrial Engineering Department and the Systems and Procedures function of Industrial Engineering must have active management support and company-wide recognition and acceptance of the functions.

The systems and procedures man can figuratively paint himself into a corner and render himself persona-non-grata if he isn't careful. Some of the things which he should avoid like the plague are:

Assuming a line function. This is sometimes called "empire building." It is sheer industrial suicide for a systems man or group to take upon themselves a faltering line function except on a temporary basis during a period of systems installation.

"Ivory Towerism." The systems man must do a large percentage of his work on his feet or in someone else's office. He must investigate thoroughly, he must get the facts as they are, not as he thinks they are. A procedure written without the real facts and submitted to line personnel for approval will always kick back on the systems man. He should physically walk through the operational steps—get the down-to-earth feel for the problem.

Misuse of the Top Executive's Name. When the systems group reports to a high executive or to the top executive, the systems man must be extremely careful not to use the big boss's name as an argument. That is reverse salesmanship and will only create resentment. The systems man isn't going to "ram" anything down the line organizations throat.

Lack of Sound Judgment. The systems man must "think through" each procedure. He must visualize each step as to its cause and its effect. He must temper statistics and mathematical formulas with good, sound judgment based on a broad background of experience.

Poor Timing. A period of confusion due to such things as holidays, fiscal year end closing, corporate reorganization, etc. is always a bad time to promote major systems

Continued

changes. Do not propose too many changes at once. Make haste slowly. All people are creatures of habit and changing systems is changing habits. Take it easy.

Lack of Salesmanship. An unfavorable reaction will almost always be noted when a systems man acts in a line capacity, takes unto himself an authority which belongs to the line, attempts to change plans of the line organization without explanation or prior consultation, or uses the top executive's authority to "ramrod" a system.

Out-experting the Experts. Let's say you are assigned to survey the personnel change system. These changes are departmental transfers, rate changes, job classification changes, and shift changes. How far does the systems man go? Does he limit his objective to the design of the smoothest, easiest system to make changes? Or does he offer advice on the actual personnel problem—should this man have a raise? Is the policy on raises fair and adequate?

We are inclined to feel that the systems designer is going to run into more trouble than he can handle if he tries to "out-expert the expert." He can't do it anyway. The personnel man who has devoted his life to his field is bound to know more about personnel work.

The systems designer should stick to his own knitting. His job is to provide a smooth system that will execute the plans of the real expert. This is a delicate decision to make. The systems designer must continually ask himself—"Am I going beyond my job? Am I trying to out-expert the real expert?" Normally, if the systems designer comes up with a good administrative system, he is doing *his* job and doing it well.

Know Your Company Policy. Whether written or not, the policies, aims, and objectives of your organization must be clearly understood by the systems man in order to always be headed in the right direction. Where statements of policy are needed, the systems man may help formulate such statements and disseminate the information to the organization.

Have a Long Range Program. A well organized Systems Group will have a long range program covering its objectives for the next year, two years, and five years. This should be reappraised, evaluated and adjusted every few months. Daily decisions and current proposals should be related to the long range plan.

Organize your Work. Since much of your work will involve the time of busy administrators and executives, a considerable saving of their time and yours can be made by having your work organized and planned to present the issues at stake in a minimum of time on each assignment. A comparative flow chart showing present procedure and its difficulties followed by a second flow chart showing proposed streamlined procedure can be grasped much quicker than pages and pages of detailed analysis. In this way a decision can be reached on several assignments during a relatively brief interview.

Plan your Contacts. With a large number of assignments, you will find you must contact men all over the factory, men who are also busy and likely to be unable to give you their attention if you attempt to contact them unexpectedly. By planning whom you will see and what you will discuss, your effectivity will be greatly increased. Use the phone, make appointments for interviews, and above all, keep your appointments. Nothing can so lower an administrator's opinion of a systems man as to have him fail to keep an appointment promptly. You may have to wait in an outer office, but *be there* when you said you would. Often it is difficult to tell when a man is going to be free. For this reason, interviews must *not* be scheduled too close together. If, however, due to reasons beyond your control, you cannot meet an appointment,

phone as soon as you realize you will be late and explain the reason why. This is not only common courtesy but common sense as well, because a man who fails to keep his appointments soon fails to make them.

Be Patient. Many times you will be unable to *sell* a whole proposal at once. Learn when to settle for "half a loaf," but in the right direction.

Keep your Word. Do not rashly promise to *do* the impossible, promise to *try*. Once you have given an estimated completed date, do your utmost to meet the deadline. If you cannot, notify those interested in the task prior to the expected completion date.

Keep your Eye on the Goal. Remember, your job is to develop the best systems and procedures for your company, not for a particular group or department. You will find people who will represent opinions or prejudices to you as facts in the hope that they can get them into your writeup. Your constant criterion must be "Is this best for the Company?". Do not enter into discussion of departmental politics. Due to the nature of systems work, you will often know a great deal of pending developments that might be interesting to your friends. However, if you prove unworthy of the confidence placed in you by discussing pending developments prior to their official release, you may be quite assured that your days in systems analysis work are numbered. Do not let an interview wander from topic to topic. State your business and keep on it. Do not argue insignificant points. Keep your temper under control at all times, by all means.

Be Honest with Yourself and your Company. Systems work calls for the highest integrity, ability and willingness to work consistently without direct supervision: to deliver a full day's work every day. An analyst working only half time impairs the efficiency of the entire systems group and cannot be tolerated.

Think Positively. For every problem there must be a "best" solution. Oftentimes discussion with people in the midst of the problem will lead you to no solution, and you will be able to list many times more reasons why you cannot solve the problem than why you can. Minimize the difficulties; write up a proposed positive system and then talk it over with those who will be called upon to make it work. Incorporate their worthy suggestions and give them credit for the entire procedure. It does you no harm to let them feel that all you had to do was to "write up their ideas," and if they feel the resulting procedure is their own doing, your job of making it work, once in effect, is minimized.

Give Credit where Credit is Due. If you are aided in your final presentation by the ideas or suggestions of someone else, do not overlook giving him a credit line in your writeup. This will not detract from your presentation and will, in fact, rebound in your favor, as you may count on continued help from the person in the future. Every man has only a given number of working days a year. The difference between the man who can scarcely keep up with his daily tasks and the man who apparently accomplishes singlehanded a week's work every day, is that the latter man has learned the secret of making others willing and anxious to help him. The cornerstone of his technique is that he never forgets that "credit line."

We are now in the Atomic Age or era, and a systems man's work is much more challenging than ever before. Today's management needs systems men, and the role they play in the future growth of our industries is of staggering importance. Do not accept your responsibility lightly. Systems men should study, keep abreast of developments, think, and thus *lead* industry and not follow. **s/p/a**

Waiting line components: customers, a gate or service point, an input proc

How to Analyze Queueing Situations

► Any discussion of probability and statistics would not be complete without touching, at least briefly, upon queueing or waiting-line theory. This operations research technique, which draws heavily upon probability theory, was developed by Erlang in the early 1900's for the Copenhagen Telephone Co. to solve certain waiting or holding time problems in an automatic telephone switching system. Since then the theory has been applied to many other types of waiting line or "bottleneck" problems, such as traffic congestion and machine feed and breakdown.

The Components

As summarized in the book *Operations Research for Management* published by the Johns Hopkins University, a queueing situation has the following components: (1) customers, (2) a gate or service point, (3) an input process, (4) some queue discipline, and (5) a service mechanism. In other words, there are customers who desire service, and after each customer moves to the service point, there is a period of time required for the service operations after which the customer leaves. Any customer who arrives while another customer is being served must wait his turn. In other words, there is a bottleneck, and a queue or waiting line forms. In the analysis of a situation such as this there are three elements which are of interest: (1) the waiting time of the customers, (2) the number of customers in the waiting line, and (3) the ratio of waiting time to service time.

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Check-Out Operation

In order to minimize costs a service-providing agency naturally seeks to serve as many customers as possible with the least number of facilities. To accomplish this objective, the usual aim is to set the service rate equal to the average rate of arrivals. This, however, is oftentimes not a very satisfactory answer. Just as soon as customer arrivals start to fluctuate random-

ut process, some queue discipline, and a service mechanism

by C. J. Craft

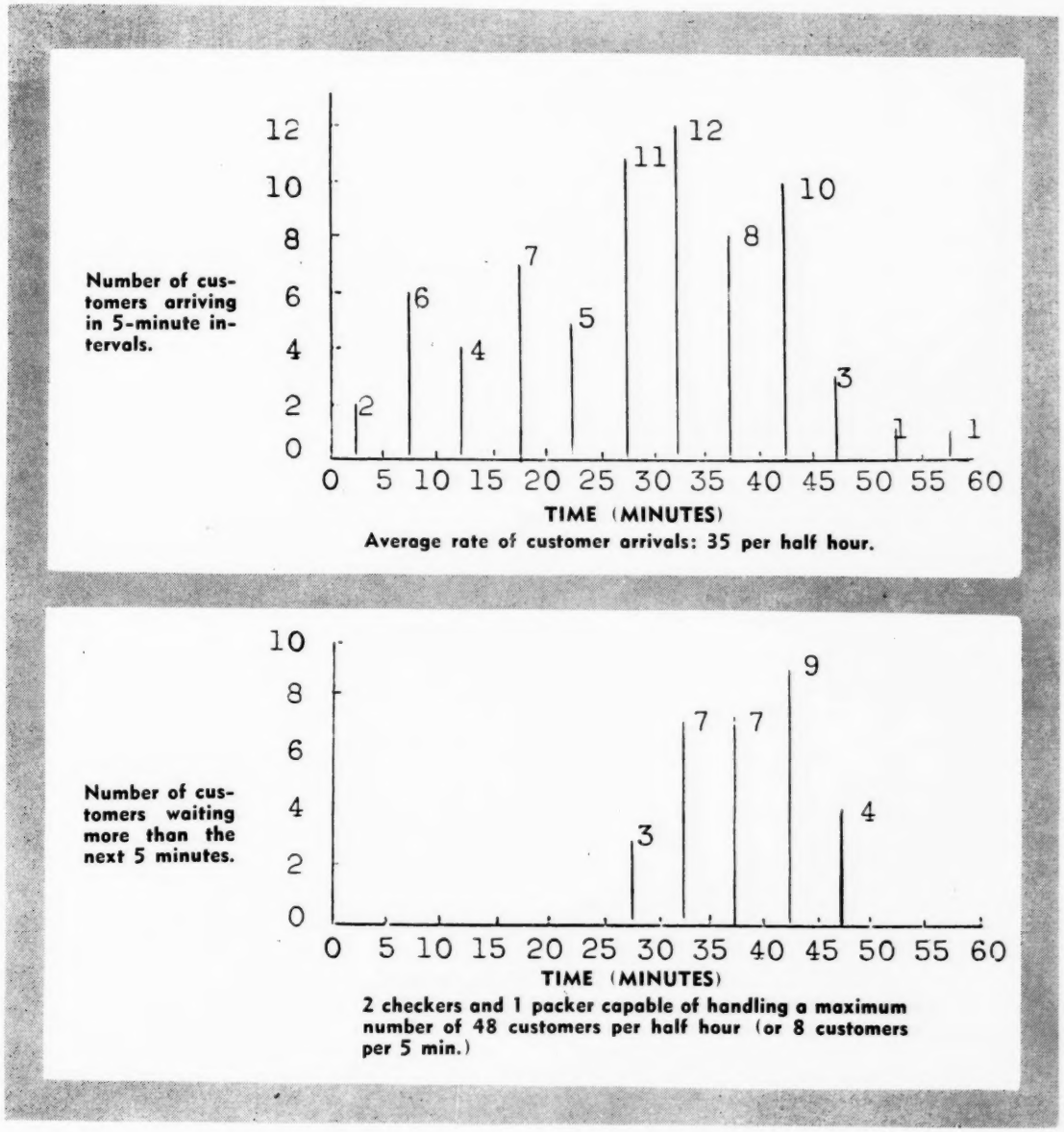


EXHIBIT I

Possible waiting lines at a check-out counter in a hypothetical retail store.

Continued

ly about the average rate, a queue or waiting line forms. Consider, for example, the problem of customers arriving at two check-out counters in a retail store. In Exhibit I we have assumed that customers are arriving randomly at a rate of 35 per half hour or 70 per hour. Based upon actual performance standards let us consider one possible check-out operation. In this example it is evident that even though the check-out operation has a potential capacity considerably greater than the average rate of arrival of customers, there is a queue or waiting line formed.

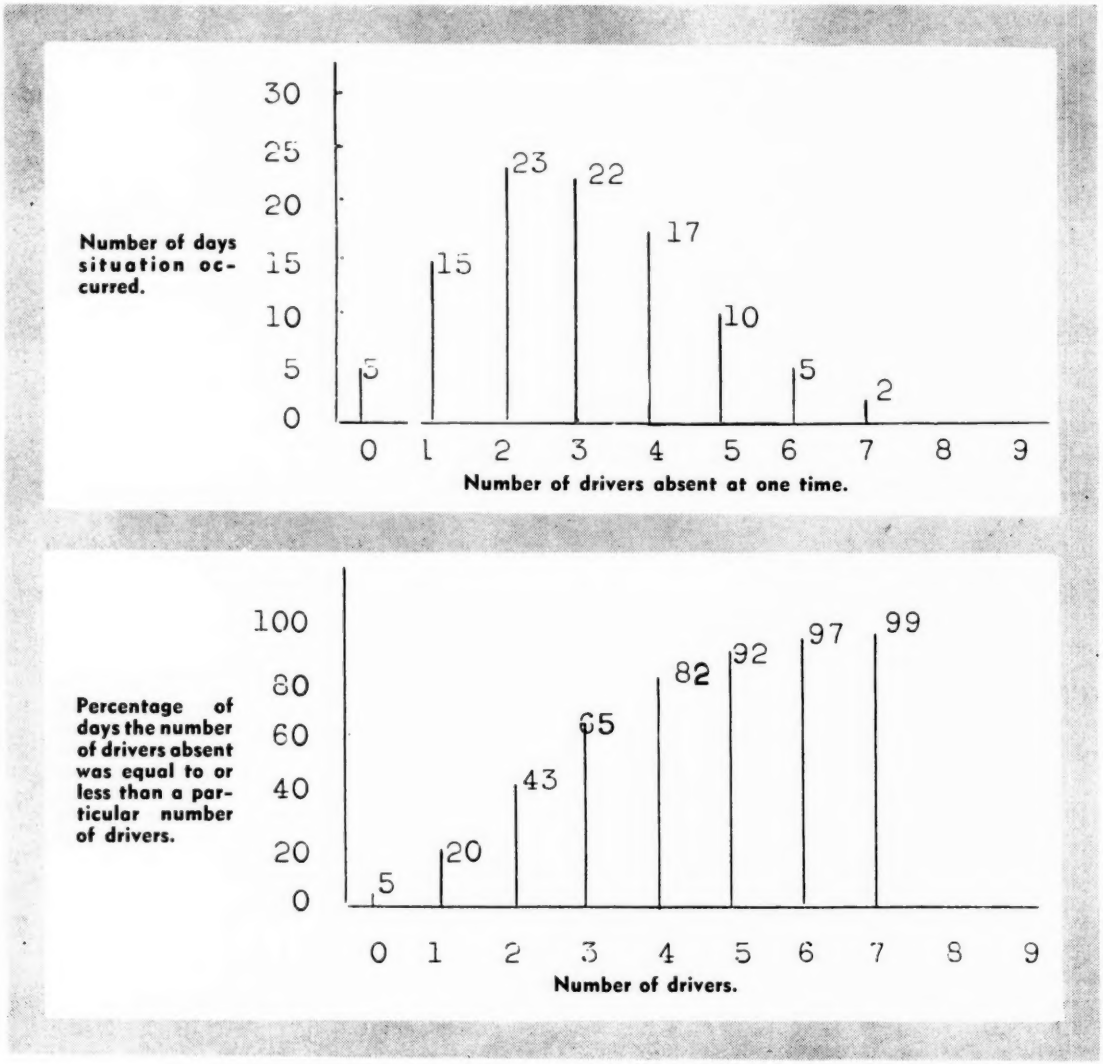


EXHIBIT II

Size of reserve of bus drivers needed to provide adequate passenger service despite absences. (In other words, on about 97% of the days 6 or less drivers are absent. Therefore, to provide adequate passenger service 97% of the time, there should be 6 drivers in the reserve.

One reason for the formation of waiting lines is that, since arrivals are random, there are times when the number of customers arriving in a particular interval of time, say, five minutes, is less than the number of customers which can be serviced in the current five minutes. As a result, there are times when more customers are waiting than can be served, and other times when no customers are waiting and no service is being provided. And such lost time reduces the effective capacity of a service-providing facility (e.g., the two check-out counters in our example) below the theoretical or maximum capacity, and results in the formation of queues. This example demonstrates the point very well: whenever the average arrival rate approaches the service rate or theoretical capacity both waiting time and the length of the waiting lines can and may increase drastically. Incidentally, it is in this area of congestion that most waiting-line problems arise.

As an example of how a waiting-line situation can be analyzed, let us consider briefly the following problem. In this case a bus company wanted to build up a reserve, or waiting line if you will, of drivers to take over the busses of absent drivers. The system normally required 300 drivers every day. Past experience showed that, on the average, a driver failed to report to work once every 100 days. The problem then was to determine how many drivers must be kept in a reserve in order to provide adequate passenger service 97% of the time.

The solution to this problem can be demonstrated very simply by means of the charts in Exhibit II. By analyzing past records of absences, a bar chart similar to the top one could be constructed. This simply shows the number of days a particular number of drivers were absent at one time. Now by converting this data to cumulative percentage totals, we can construct the second bar chart as shown. This shows the percentage of days the number of absences was equal to or less than various numbers. From this analysis it is obvious that on about 97% of the days, there are 6 or less drivers absent. Therefore, in order to provide adequate passenger service 97% of the time, it is simply necessary to have 6 drivers in the reserve or waiting line.

This type of analysis has been applied to quite a variety of waiting-line situations. A partial list of other possible applications is:

(1) The loading or unloading of trains or trucks at receiving platforms.
(2) The design of waiting areas for trains, trucks, tote boxes, fork-lift trucks, etc.
(3) The scheduling of customers for any service-providing agency.
(4) The processing of items through a bottleneck operation.
(5) The staffing of a maintenance or service department to handle unscheduled machine breakdown and equipment failure.
(6) The establishment of bus or train schedules.
(7) The staffing of a storeroom, tool crib, etc., to provide a specific quality of service.
(8) The staffing of a clerical operation for processing within a limited period of time a varying level of customer arrivals or flow of paper work, such as customer orders.

In all these problem situations the method of analysis is much like that demonstrated in the bus example. Past experience is analyzed, whenever available, to determine the pattern or distribution of the random variations of customer arrivals, orders, paper work flow, trucks, breakdowns, and so forth. Then, it is a relatively simple matter to convert such data to probabilities which can then be used to design the size of a staff or physical facilities required in order to provide a specified quality of service or performance. **s/p/a**

A special type of salesmanship - - factual and conservative - - is needed in systems work.

The Systems Organization Must b

► Selling, like human relations, is woven into the over-all pattern of the Systems Specialist's charter for doing business. You will not find it greatly emphasized in his position description; however, to be successful he must be able to sell himself and his ideas from the very inception of an assignment through the final phase, namely, completing the installation of the approved project.

A Systems group justifies its existence commensurate with the operational improvements and cost reduction which results from its efforts. The technique of selling is a major asset in successfully obtaining these tangible results. Selling, in the sense we apply the term, perhaps requires some slight clarification as it is a special type of salesmanship. It must be factual and should be conservative.

Victor H. Roman is manager, organization and methods research division, Corporation Comptroller's Staff, Standard Oil Company of California. He is a charter member and former president of the San Francisco chapter and former national director of the SPA.

Being factual requires that the Systems Specialist must himself be sold on the ideas he is trying to sell to others and that these ideas have been tested sufficiently to establish their soundness. Factual presentations will stand up under review and will tend to build confidence in those to whom a project must be sold. Building confidence is a must if the Systems Organization is to be successful and endure. The seed for creating confidence is a completed assignment which measures up to the recommendations and forecast of results upon which approval of the project was obtained. As previously stated, our brand of selling should also be conservative. There is a natural tendency to over-estimate the anticipated benefits in order to sell the proposal; however, management has every right to expect results which measure up to the report package they approved. Accuracy in this respect is, of course, the ideal for which we should strive. However, as pinpoint accuracy in this respect is difficult on the larger surveys we should adopt the conservative approach, as overestimating benefits breaks down confidence in the Systems Organization.

Certainly it goes without saying that the high pressure type of sales approach has no place in this scheme of things. It is not compatible with the terms factual and conserv-

by V. H. Roman

be Sold

ative, nor is it necessary to employ this method in selling a well designed portrayal of findings and recommendations.

The initial approach to conducting a methods survey requires a definite outline of scope, objectives, planned course of action, selection of the survey crew and a time estimate for completing the job. Normally, a form of "Project Work Order" is utilized to define these items. It also serves as an outline for the organization being reviewed as well as for the survey crew and for respective management whose approval is required. Here is the first opportunity to consider the sales approach. The choice of words in framing the Project Work Order is important. Refrain from using terms which indicate the necessity to correct any existing unsatisfactory conditions, personnel problems or lack of adequate supervision. Matters of this nature can be handled orally, if necessary at all, rather than made part of the written charter. Such conditions may better be left for development and correction during progress of the survey when they can be dealt with and weighed carefully as to how they will be reported.

In selecting the survey personnel, especially for the larger projects, the joint venture approach has particular merit. Under this plan a qualified representative of the office force being surveyed is made a member of the survey crew. Such an individual having a full knowledge of the work performed and the reasoning behind the existing work methods being used can be of material assistance in the over-all effort. From a sales viewpoint this plan gives the employees under review assurance that their interests will be represented through the office representative's active participation in the project. After the survey recommendations have been approved, this representative being familiar, and it is assumed in accord, with the recommendations is in an excellent position to sell the plan to the employees and assist with the change-over or installation program.

When discussing work assignments with personnel on the job it is desirable to solicit their suggestions and be considerate of their work problems. Avoid criticism of existing methods. Conversely, favorable comment with regard to current practices creates good will and should be expressed when warranted. To avoid differences at a later and more crucial period, it is well to review the job inventory notes with the employee and his supervisor. This tact will disclose any omissions or misinterpretations and will create a feeling of participation in the project.

The idea of change is in itself a difficult product to sell as it implies criticism of existing work methods. Change means learning a new way of doing a job, some temporary confusion and added effort during the change-over period. By adopting the following approach to this problem we can minimize the degree of change necessary at a given time.

During the progress of a survey better ways of doing the work are developed. Some of these developments may be limited in their over-all scope and affect only a small segment of the work. In such instances it is advisable to obtain approval and place the new modification into effect immediately, thus reducing the number of changes

Continued

necessary upon completion of the project.

One of the major steps in "Evaluating a Project" is a complete analysis of the systems and procedures presently being used. Following this analysis we must develop and evaluate other ways the work can be performed. Selection of the most practicable and economical system and related procedures as a result of these findings is the basis for formulating the report recommendations. During this phase of the project, including composition of the survey report, the sales aspect may be favorably applied in several ways.

Our analysis work, findings and recommendations should, of course, be complete, factual and conservative.

Needs of Management

The management viewpoint is important to the extent report design, content and frequency adequately meet the needs of management.

Consideration should be given to financial or other control requirements which will permit convenient audit of the records.

Manpower requirements should be carefully reviewed to make certain they have not been underestimated. Likewise, work performance standards should be consistent with normal expectancy.

The report language should be clear and concise. It is well to preface the detail part of the report with a summary (not exceeding two pages) covering all the major points of interest, recommendations, savings, installation costs and payout. This will permit top level management to review the significant facts without going through all of the detail, flow charts, graphs, and other exhibits.

Do not fail to include recognition and appreciation of suggestions received from the employees during the survey. It is also advisable to acknowledge the cooperation of supervisors and others who assisted the Systems analysts during the review.

When policy permits, and change-over to a new system is involved, an offer to make the installation, or to assist in this regard should be proposed. The Systems Specialist, being familiar with the detail involved, is best qualified to perform this task. Furthermore, a smooth conversion goes a long way in selling our services.

Here's an idea

An efficient and inexpensive way to schedule the work of field service personnel has been devised by Consolidated Electrodynamics Corporation, Pasadena, Calif.

The company uses a type of scheduling board which normally is used only for production control. Instead of representing machines, the pegs in Consolidated's board represent field service engineers and specific jobs which are to be accomplished.

This system has proved to be a simple and economical answer to a problem of scheduling that formerly was complicated and costly. By using the board, we are able to schedule easily and accurately each job and each man. We have a constant visible picture of our entire work load. Without reference to paper work, we can tell at a glance the availability of each man, the starting and finishing date of each job, the engineer assigned to the job, and whether or not the job can be rescheduled.

The scheduling device, called a "Produc-Trol Board" by its manufacturer, Wassell Organization, Inc.,

Prior to making the installation, careful plans should be made to allow for adequate training of personnel, dual operation for a period if necessary and allocating sufficient time to make the change-over, thus avoiding excessive overtime and confusion which is undesirable from both the management and employee viewpoint.

In closing my remarks on "Selling Systems" as it applies to "Evaluating a Project," let me make the broad statement that an opportunity to sell our service is inherent in every phase of Systems work. The extent to which we use this technique will have a definite bearing on the continuing success of our efforts. **s/p/a**

Secretary Mary Garrett and service supervisor Lloyd Ekstrom demonstrate board.

Westport, Connecticut, is easily operated by clerical personnel, releasing management for more vital work.

The board, about three feet square, hangs on the wall. To the left is a panel of pockets to hold index cards, one for each job.

To the right of the index panel is a large punch board 200 holes wide. A cardboard strip is fastened across the top of the peg-board section, showing dates for 200 days, each peg-hole representing one day. Brightly colored plastic pegs are placed under the dates of scheduled visits for each job.

A cord with a peg at each end is placed on the board vertically under the current date. This cord is called a "Today Line" and is moved forward each day. Another vertical cord is placed one month in advance. This creates a pattern of the entire work load for the coming month.

The variations in assignments are shown by using pegs of different colors to signify different situations. For example, a yellow peg is used to show the date when a job is to start. If no engineer has been assigned to the job, a plain yellow peg is used. If an engineer has been assigned, his number is printed on the peg. If it is essential that the job be completed on a fixed date, a red peg is placed under the completion date. If this date can be changed, a green peg is used to show the completion date.

Any desired number of variations can be obtained by using pegs of different colors. The specific meaning of each peg used is shown on a legend card at the top of the board so that all significant facts can be read easily and instantly. Schedule changes involve shifting one or two pegs. **s/p/a**

—BY S. L. MERRILL, *assistant to the vice president of marketing, Consolidated Electrodynamics Corp., Pasadena, Calif., and president of the Southern California chapter of SPA.*

Worth Reading

"Multiple Deliveries From Only One Typing"

Modern Office Procedures, September 1956.

Describes Argus Camera's purchase order which provides, as one of its copies, a reproducible master for use as a receiving report. Shipments are recorded as goods are received and required copies are run off. The master is then filed to await further deliveries.

"A Handwritten System that Beat A Machine"

Harry L. Mitchell, *The Office,* August 1956.

Describes how a redesigned form improved service and speeded postings of over-the-counter business of General Aircraft Supply Company. Before, a copy of a sales ticket was sent to accounting for pricing, recording, and preparation of an invoice. A form was designed to make all entries in one writing, except for inventory control.

"Machine Control of Records"

Donald T. McDaniel, *The Controller,* November 1956.

Illustrated description of mechanized accounting for a cleaning products wholesaler with 70 "brokers" and 4000 accounts. Covers broker's commissions, accounts receivable, accounts payable, inventory control, and general ledger.

"A Data Processing Revolution in Department Store Sales Accounting"

August J. Carson, *NACA Bulletin,* August 1956.

Detailed illustrated article on integrated data processing applied to a department store. Specially punched price tickets are put on each item. These are automatically transferred to the sales slip with data about the clerk and customer. At the same time, punched tape is prepared automatically. The tape is then transferred to punched cards for processing.

"A Revolution in Filing Procedure"

Systems and Procedures Staff, American Insurance Company, *Office Executive,* November 1956.

Describes a unique open shelf filing system housing 2 million insurance policies. About 13,000 policies are handled daily. Mobile desk and chair units riding on a track parallel to the shelves are used. The units have telephone connection so that information can be furnished quickly. Middle digit filing system is explained.

"How Progress is Reported in a Forms Control Program"

Ray Marien, *The Office,* September, 1956.

Detailed illustrated description of progress reports required from decentralized forms units by corporate headquarters of Olin Mathison Chemical Corp. Primarily they report dollar savings in printing costs. Clerical savings are not stressed on the basis that they are potential savings only. Several examples of savings in printing cost are given. Four report forms are illustrated.

How Home Life Insurance Company created and used "Mr. Spendrite" to effect savings

A CASE STUDY

Popularizing Expense Management

► The subject I'd like to talk about is "*Popularizing Expense Management.*" As to "Expense Management" itself, however, I'll touch on it only very briefly. Rather, it's the "Popularizing" of this phase of management to which I'd like to devote most of my thoughts. And it's in that area of "*popularizing*" that Home Life has done something which you might find of interest and value.

First, a word or two about the Home Life Insurance Company may be helpful. Our Home Office is located in downtown New York and we have approximately 70 Field Offices. We employ around 1,250 people, of which some 590 are located in our Home Office. Of the 718 Life Insurance Companies in the United States, we rank 42nd in size with Total Ordinary and Group Insurance In Force of over $1,600,000,000.

We are known best, perhaps, for our Planned Estates Service. Home Life originated Planned Estates (which coordinates all of a man's insurance) as a company-wide operation back in 1933. As a result of this service, and the higher income market to which it is geared, our average new policy sale is over $12,000—which has been the highest average policy sold by any company in the country.

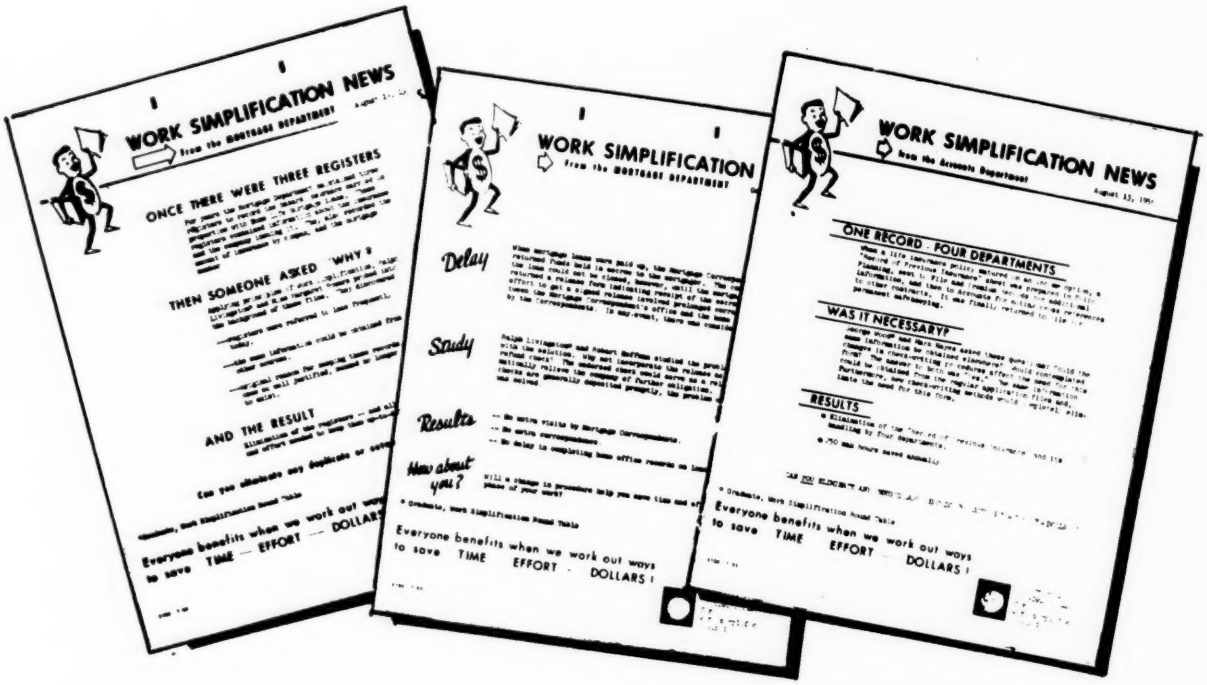
Knowing one's self is pretty highly regarded at Home Life. If a company can be said to have a philosophy, self-examination is surely an important part of this one's.

Naturally, without any such self-examination from time to time, it's awfully easy to drift into ways of doing business that, like Topsy, "just grow"—with no particular justification for existence.

So, periodic "inventories"—of service to clients, of public acceptance, of methods and operations, of *systems and procedures*—are something from which any business organization can derive considerable profit.

A talk given by Eugene C. Kelly, assistant vice-president, Home Life Insurance Company, in October 1956 before the New York Chapter of The Systems & Procedures Association of America.

Continued


WORK SIMPLIFICATION NEWS
from the MORTGAGE DEPARTMENT
ONCE THERE WERE THREE REGISTERS
THEN SOMEONE ASKED "WHY?"
AND THE RESULT
Everyone benefits when we work out ways to save TIME — EFFORT — DOLLARS!
WORK SIMPLIFICATION
from the MORTGAGE DEPARTMENT
Delay
Study
Results
How about you?
Everyone benefits when we work out ways to save TIME EFFORT DOLLARS!
WORK SIMPLIFICATION NEWS
from the Accounts Department
ONE RECORD - FOUR DEPARTMENTS
WAS IT NECESSARY?
RESULTS
Everyone benefits when we work out ways to save TIME EFFORT DOLLARS!

But, human nature and the press of day-to-day business being what they are, such self-examinations generally don't get started *all by themselves.* They need an *impetus*—some push from the outside—to get the critical ball rolling.

For Example:

All of us in one way or another felt the impetus brought on by World War II when the manpower shortage demanded a general belt-tightening by all companies on their operations. I am sure it was true in your company—as it was in Home Life—that this belt-tightening eliminated methods and practices that had just "grown" over the years or had been allowed to drift away from the original intent.

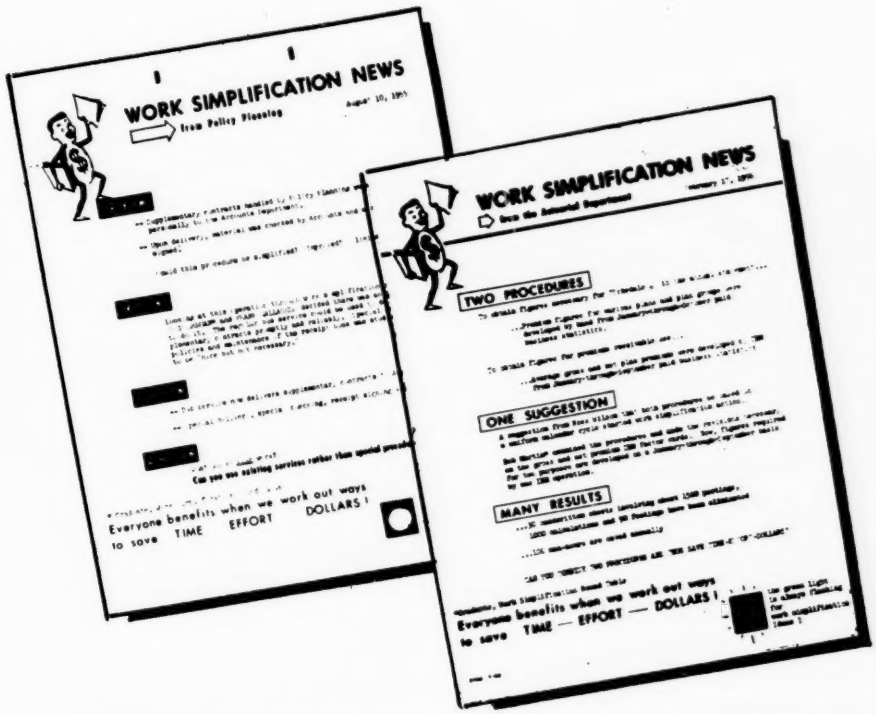
More recently, in our case, as in the case of a number of other life insurance companies, another situation developed that gave decided impetus to an earlier scheduling of our periodic "inventorying" of practices, *systems and procedures*, etc. Again, it was a push from the outside that brought home to many of us the importance of continuing examination of methods and operations.

I refer to the outdated limitations on insurance companies' expenses formerly imposed by Section 213 of the New York State Insurance Law.

As you know, the life insurance industry is regulated by law to a far greater extent than most other industries. Basically, Section 213 limits the amount of expense that can be incurred annually by an insurance company during its normal course of business.

The Section has been made more realistic since then, but before the Law was revised, Home Life—along with other companies—was feeling the expense-limitation pinch rather keenly, and we had no way of knowing when much needed legislative relief might come.

Ironically—because "first year" or "new client" *selling* costs are rather high compared to "renewal" or "old client" *maintenance* costs, the limitations imposed by the


WORK SIMPLIFICATION NEWS
from Policy Pleasing
Everyone benefits when we work out ways to save TIME EFFORT DOLLARS!
WORK SIMPLIFICATION NEWS
from the Actuarial Department
TWO PROCEDURES
ONE SUGGESTION
MANY RESULTS
Everyone benefits when we work out ways to save TIME — EFFORT — DOLLARS!

Here are five examples of reports made by various departments on time, money or effort saving ideas put to work at Home Life.

old "213 Law" weighed most heavily on the "fast growing" company. That, I believe, is a category in which Home Life—whose insurance in force has *tripled* over the last 11 years—may be said to fit.

So—with apologies to our TV friend, George Gobel, there we were!

Something had to give—or, at least, remain stationary. There was our impetus, *above* and *beyond* our normal interest in operating soundly—and to the extent that it provided this *impetus* the "213 Squeeze" did us a great favor.

In April 1953, the response to this impetus was crystallized with the appointment by our President of the "Temporary Committee for Operations Survey." Though the Committee's name was something less than a model of simplicity, its aim was clear and definite:

> ". . . to study our field and home office operations generally and in as much detail as shall prove necessary in order to plan how such operations may be improved, consolidated, or eliminated. . . ."

The Committee's work, however, was predicated on several essential premises:

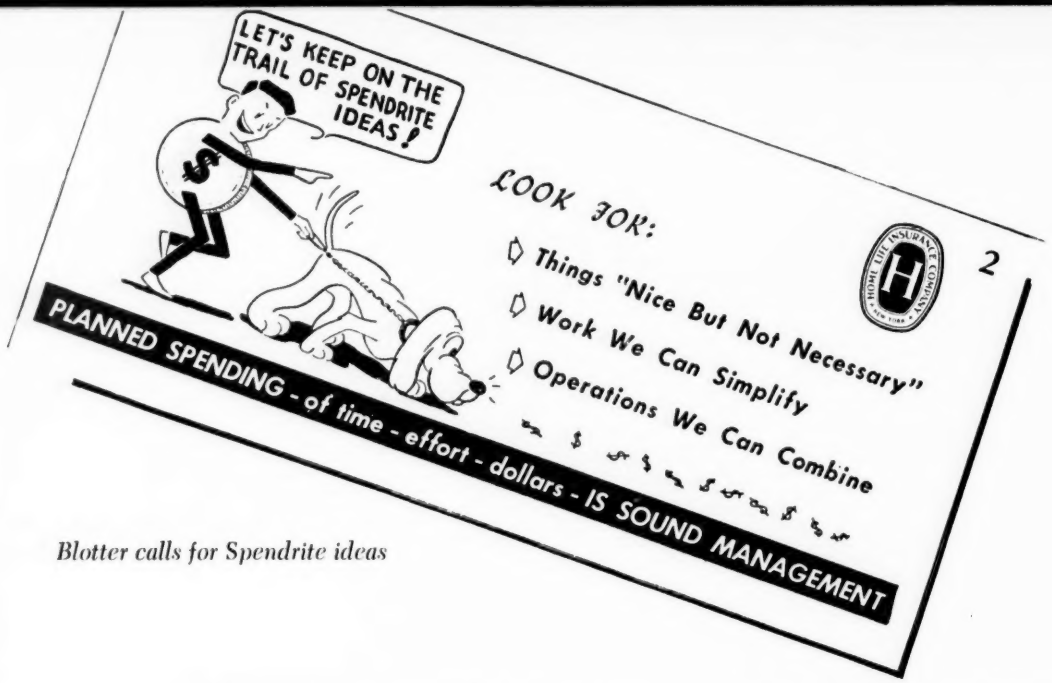
(a) Any changes made should produce savings of maximum permanence with a minimum of delay;

(b) There should not be eliminated any report or analysis which was essential to management for proper knowledge of company operations;

(c) And—of most importance—no changes should be made that would adversely affect service to policyowners and to the field organization; employee morale, or Home Life's standing with the public and with the insurance industry.

After the Committee's preliminary studies (which included comparisons with other life insurance companies' operations and costs) were completed, we began tackling our expense management program in four big areas:

1. Maximum utilization of personnel;
2. Streamlining and modernization of methods;


LET'S KEEP ON THE TRAIL OF SPENDRITE IDEAS!
LOOK FOR:
Things "Nice But Not Necessary"
Work We Can Simplify
Operations We Can Combine
2
PLANNED SPENDING - of time - effort - dollars - IS SOUND MANAGEMENT

Blotter calls for Spendrite ideas

3. Elimination or consolidation of functions; and
4. Reduction of services and equipment purchases outside the company.

Rather promptly after getting under way, the program's aims and efforts became distilled into this watchword: "Hold-the-line."

It was a simple slogan, but it stood for a rather awesome objective.

Essentially, "Hold-the-line" meant that, while the company was to continue its accelerated growth during 1954, and would have 100 million more insurance in force to service, *expenses for that year were to be held at the previous year's level.*

The "line would have to be held on all fronts: on personnel strength, on costs of countless functions and services, on agency office expenses. And all in the face of a constantly rising total of insurance in force.

At any rate, we had an immediate objective and we buckled down to spreading the gospel of "hold the line."

The program's aims were set forth several times before the entire management group and they responded admirably. More than *200 suggestions* for savings came in from them within months.

Work distribution and job classification charts were prepared by each department and, with the assistance of department heads, all jobs in the home office were analyzed and inventoried. Where a termination occurred, the vacant position was carefully studied as to whether or not it was essential to the company's progress—and, accordingly, as to whether or not it had to be filled again.

With regard to our sales organization in the field, every agency manager was brought to the Home Office and given an individual briefing on his responsibility to "hold-the-line" on his agency office expenses.

Our program was solidly under way. Yet, we felt one element was still missing.

It wasn't enough to get participation on the upper management levels and bank on the "Hold-the-Line" spirit seeping downward through the organization. For our program to be successful, it needed speedy and enthusiastic participation on all levels —and it needed continuing support throughout the company.

But how could we get speedy participation and continuing support . . . from every last Home Lifer? . . . from president to office boy? . . . from Maine to California?

Unfortunately, budgeting is never a particularly popular subject. The word itself conjures up ideas of penny-pinching and

belt-tightening. And negative reactions such as this—we realized—might well keep our "Hold-the-Line" program from becoming more than upper-echelon aims and resolutions.

Expense management was something the whole organization had to be sold on. Accordingly, to "sell" such a "mass market," we decided to use a "mass medium"—a symbol.

Establishing that there *should be* a symbol of our expense management activities was one thing. Figuring out just what it *would be* was a considerably more involved story.

We worked from the premise that this symbol should definitely have a promotional flavor. It would have to capture imaginations, implanting in them expense management principles, and yet do so in a light, appealing way.

After weighing a number of possible solutions, it was felt that a cartoon-type of treatment would be best . . . something like Peter Pain, Mr. Coffee Nerves, or others of that type.

But what should this cartoon character be? We started thrashing that problem around and the "creative" agonies were almost endless.

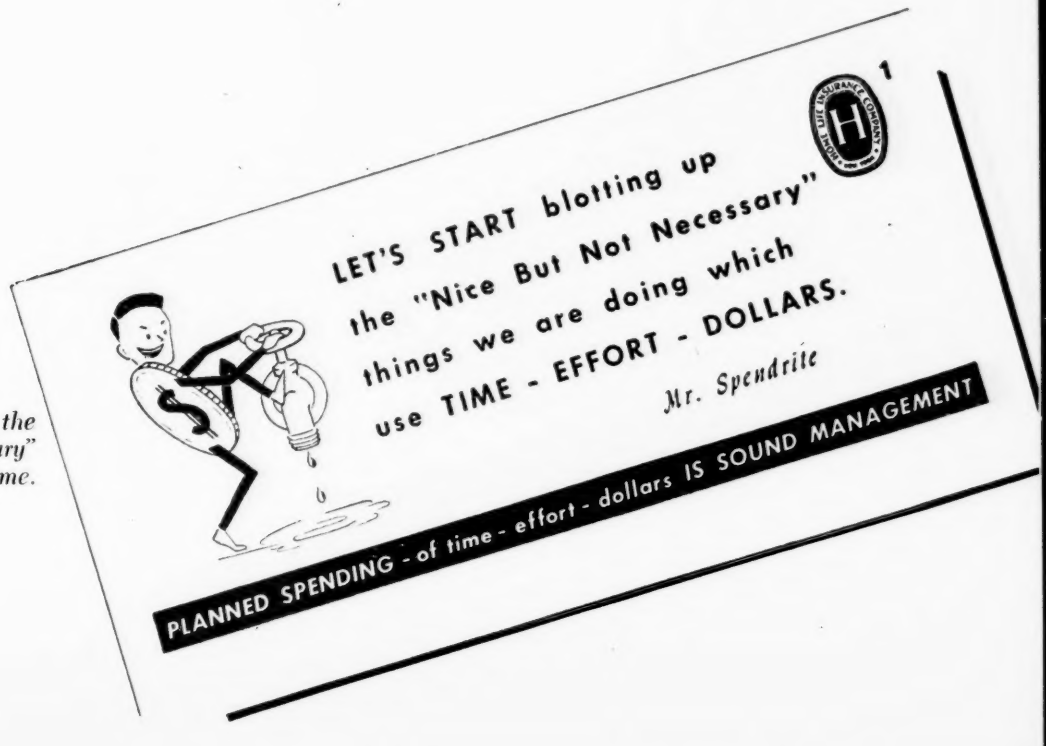
Seeking a name, we hit on everything from a rather old-maidish "Nellie Net Cost" to a Scottish character called "Mac-Hold-the-Line." As I'm sure you'll agree, they didn't exactly have the ring of immortality to them. And, more important, they had strong negative overtones.

What we needed was a *positive character—not a negative one.* Our program was not directed at *restricting* expenses, but *planning* them. Our expense management goal was *not* to avoid spending, but to *spend right.*

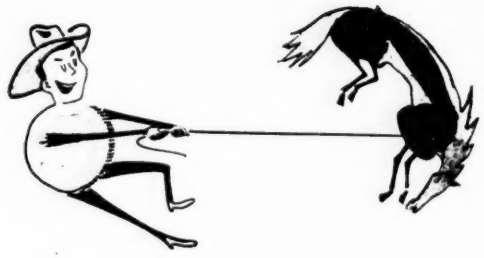
Somewhere in one of our many conferences, those two words clicked, and our symbol was born!

Our famous *Mr. Spendrite* made his bow to the Home Life organization in the January 1954 issue of our company magazine—and he wasted no time in becoming part of the Home Life family.

Wherever he appeared, he was a positive symbol. His manner was cheery, his face wreathed in smiles, his message conversational. Even his own personal slogan was positive: *"Planned Spending—of Time, Ef-*


LET'S START blotting up
the "Nice But Not Necessary"
things we are doing which
use TIME - EFFORT - DOLLARS.
Mr. Spendrite
PLANNED SPENDING - of time - effort - dollars IS SOUND MANAGEMENT

Another blotter plugs the "nice but not necessary" theme.



fort, Dollars—is Sound Management."

Mr. Spendrite was everywhere. We kept a constant stream of promotional material beamed at all Home Life. He appeared on blotters, bulletins, memorandums, posters.

No issue of our house organ appeared without an article bearing advice and encouragement from Mr. Spendrite, or giving a boost to someone who had aided the expense management program.

Mr. Spendrite was given a prominent place at meetings of our sales organization.

Every possible promotional tie-in was used to spread Mr. Spendrite's message. Even egg timers were distributed to serve as reminders for limiting the length of long distance phone calls.

The heart of this Spendrite Program was repetition—keeping him and his principles continually before all Home Life. Before long, this saturation method begun to pay off.

Mr. Spendrite's prime target was the "nice but not necessary"—the procedures that had "just grown." Under his urging, people began asking themselves, "Why do we do the job this way, and is there a better way to do it?"

Often, they did find there was a better way. Suggestions for streamlining Home Life's operations—including various and sundry ideas to save money—began pouring in from both home office and field.

No suggestions for savings were too big or too small to be considered. We had big ones; yearly savings of $25,000 resulted from improved "Credit Reporting" practices. We had small ones, such as in our Chicago Agency, where above every light switch was pasted a card reading: "Mr. Spendrite says. . . . Please turn of the lights! Thank you."

Wherever possible, savings which had been effected were dramatized—even though the dollars saved were few—because it was our feeling—and the success of our program proved it—that by emphasizing the importance of the small expense reductions we created the proper atmosphere for the big ones.

Spendrite had, indeed, become an integral part of Home Life. People actually began saying: "Is this the Spendrite way?" and, in situations calling for an expenditure, we often hear "What would Mr. Spendrite say about this?"

Our Agency Managers, at their 1954 Spring Meeting, staged an inspiring skit which demonstrated their complete backing of the Spendrite Program. Throughout both field and Home Office, there was every evidence of the most enthusiastic cooperation. The President of our company, W. P. Worthington, termed it: ". . . one of the finest examples of teamwork I have ever witnessed in my more than 20 years with this company."

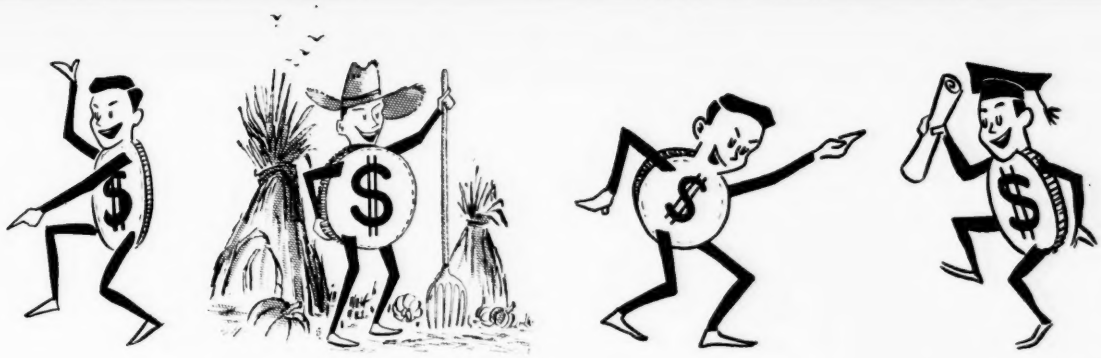
And, this spirit of cooperation with Mr. Spendrite and his aims continued at the same pace throughout the year.

Well, just what did Mr. Spendrite's work mean in sum—or, better put, with *does* it mean?

First of all, his success in helping us "Hold-the-Line" in 1954 was strikingly apparent.

Where our total Home Office expenses had zoomed 7.8% in 1953, they were up just a flat 1% in 1954.

Where our agency office expenses had in-



creased 11.1% in 1953, they decreased 3% in 1954.

There were 436 on the H. O. payroll in our Ordinary Branch on 8/1/53—17 months later, on 12/31/54, there were 16 fewer.

In 1953: Our total Ordinary insurance in force had grown 7.8%—but our total expenses had increased 11.4%.

In 1954: Thanks to Mr. Spendrite and our "Hold-the-Line" program, total Home Office and field expenses were up only 2.7%, while the in-force total jumped 6.4%.

Those percentages expressed very real and valuable dollar savings. They enabled us to continue in 1954 the upward curve of company growth—at an expense rate substantially below those in the past.

Had these immediate economies been the only result of the Mr. Spendrite campaign, Home Life would have been well satisfied. However, the influence of Spendrite has proved much more far-reaching.

Through this program, we have found that the entire organization has been permeated by the philosophy of Holding-the-Line on expenses; that it has been inculcated, at all levels, with the conviction that "Planned Spending—of time, effort, dollars—Is *Everybody's* Job."

Ample evidence of this influence was contained in the numerous messages received on Mr. Spendrite's first birthday. In short, the Spendrite Program itself created an atmosphere ideally suited for futher expense management activities.

Thanks to the creation of this healthy atmosphere, Home Life was able to introduce a new Agency Building Expense Formula which was enthusiastically received by our agency managers.

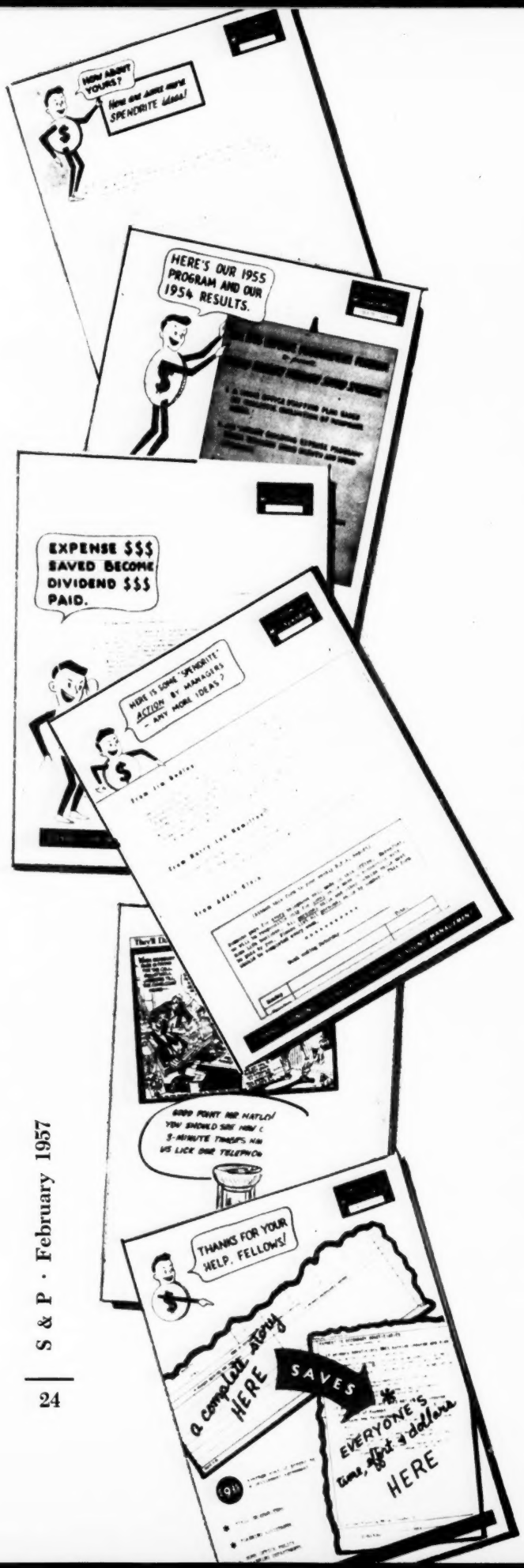
Again, using the Spendrite Program's foundation in another way, we are conducting—under the able direction of our Methods Division—an organized Work Simplification Program which has met with enthusiastic endorsement and company-wide cooperation.

To prepare for the Work Simplification phase of our program, we sent two of our Methods men to NYU to attend Professor Mullee's Work Simplification Round Table. Our aim was for these two men to learn as much as possible about ways and means of organizing such a program in Home Life. About eighteen months ago we launched a formal Work Simplification program.

Our program was sold primarily—as a means—as an opportunity for Home Life employees to expand their knowledge of office management principles and sharpen their skills. By working easier and seeking better methods of operation we hoped to save time and money. We hoped to install a sense of creativeness in our employees. Also, the program was to serve as a means of giving our employees due recognition for tasks accomplished and ideas presented. We wanted to make each individual employee feel that he was not only participating in our program—but more important—that he *could share in its benefits.*

Basically, what we are trying to do is place more emphasis on getting results through the combined efforts of everyone on the payroll rather than through just a few of the management group—or the Methods Division "Consultants."

We didn't want control of expense management to be a closed club; we wanted everyone to belong. Not only was Work


HOW ABOUT YOURS?
HERE'S OUR 1955 PROGRAM AND OUR 1954 RESULTS.
EXPENSE $$$ SAVED BECOME DIVIDEND $$$ PAID.
HERE IS SOME "SPENDRITE" ACTION BY MANAGERS — ANY MORE IDEAS?
THANKS FOR YOUR HELP, FELLOWS!
a complete story HERE
SAVES
EVERYONE'S
HERE

Simplification to be a means for eliminating steps, a procedure of combining, rearranging or simplifying these steps, but it was to involve more than that. Through the program we hope to have each employee assigned a fair share of the work in each department. Each employee would be secure in the knowledge that the work was being done in the best possible manner. What we are trying to do is create a working atmosphere—we are trying to motivate our employees to apply Work Simplification principles to their every-day tasks as a matter of course, rather than as an added responsibility.

We are very pleased with our first-year results:

135 different projects completed
16,000 man-hours saved
and the results for the 5th quarter just closed shows that this pace is continuing.

And so the influence of Mr. Spendrite goes. He has—and will continue to—spearhead our efforts to "streamline" our operations. He has given us a foundation for a host of further activities geared to sound expense management.

A most popular announcement which increased the take-home pay of all Home Lifers was made by our President on January 1st of this year. His announcement concluded with this paragraph:

"These upward adjustments of compensation and security benefits are, in part at least, made possible by increased efficiency in operation. It, therefore, should be gratifying to all of you who have been and are now participating so effectively in the Spendrite and Work Simplification Programs, that your contributions have played a part in making possible the good news I have just announced."

Mr. Spendrite has shown, we feel, that it is truly possible not only to popularize this subject of expense management, but to *make it work.* We hope he is with us a long, long time. **s/p/a**

Now that you can buy IBM equipment, should you?

Purchase versus Rental of Data Processing Equipment

by Donald C. Niles

► Toward the end of November 1956, the International Business Machines Corporation offered to sell, beginning January 1, 1957, new punched card accounting and electronic data processing machines; and also offered for sale, during the period January 1, 1957 through July 25, 1958, equipment previously installed or installed during such period. Such offers resulted from the consent by IBM, early in 1956, to the entry of a judgment in the antitrust action instituted by the Department of Justice in 1952. In view of the special nature of electronic data processing equipment this article deals specifically with punched card equipment.

Heretofore, punched card data processing equipment had been available on a rental basis only, and this offer on the part of IBM has confronted users of punched card equipment with deciding whether to buy, at depreciated prices, equipment presently installed, or to continue its rental.

Donald C. Niles, author of this analysis, is manager of the planning department at the Federal Reserve Bank of New York.

RESEARCH REPORT prepared under the direction of The Systems & Procedures Association of America, National Research Committee, F. Walton Wanner, Chairman.

This article expresses the views of the author, and not necessarily those of the Federal Reserve Bank of New York nor of the Systems and Procedures Association of America.

The resolution of this question is somewhat technical, and there are involved several intangible factors which are extremely difficult, if not impossible, to evaluate on a dollar and cents basis. This article briefly discusses some of the intangible considerations that must be evaluated by each user of IBM punched card equipment, and also presents certain analytical techniques that may be applied to develop factual data having a bearing upon the decision as to whether to continue to rent or to purchase outright such machine equipment.

Continued

(1) FUTURE AGE OF MACHINE	(2) PURCHASE PRICE	(3) IBM ANNUAL MAINTENANCE	(4) BALANCE BEFORE INTEREST	(5) AVERAGE BALANCE FOR INTEREST CALCULATION	(6) ANNUAL INTEREST	(7) BALANCE AFTER INTEREST	ACCU
	$28,628		$28,628	-	-	$28,628	
6		$2,121	20,189	$24,409	$1,465	21,654	$1(
7		2,505	13,599	17,627	1,058	14,657	2
8		2,505	6,602	10,630	638	7,240	3
9		2,505	-	3,620*	199	-	4

*When the remaining balance in column 7 is less than the annual saving $8,055 (i.e. rent $10,560 — IBM maintenance $2,505) compute average balance as in column 5, but then divide the monthly saving $671.25 ($8,055 divided by 12) into the remaining balance in column 7 to obtain the number of months (to the nearest full month) for interest calculation.

(a) $\frac{7240 + 0}{2} = 3620$ (b) $\frac{7240}{671.25} = 10.78$ or 11 months

(c) 3620 X .055 = $199 interest

**Approximately one month's savings ($\frac{616}{671} = 91\%$), therefore break-even point is 3 years, 11 months.

The price of used machine equipment includes an allowance of 10 per cent per year for each full year of age of such equipment, and is computed on a monthly basis, based upon the January 1, 1957 purchase price of a new machine; however, no purchase price can be less than 25 per cent of the new machine price for the same type and model.

While installed equipment may be purchased on an installment payment plan, and while new equipment may be purchased on an installment purchase plan or through a lease-purchase option, only outright purchase of equipment is evaluated in this article, in that either of these alternative purchase plans is considered less advantageous to the customer than outright purchase.

In general, the conditions of sale are considered conventional, and only those conditions which have a bearing on purchase versus rental of machine equipment are discussed herein. Copies of any contract forms can be obtained from IBM.

One significant condition of sale is the offer on the part of IBM to accept purchased machines for trade-in on other IBM machines. In brief, the original purchaser of any IBM machine equipment may trade in a purchased unit or combination of units only when the customer buys new equipment from IBM, and the trade-in allowance cannot exceed 55 per cent of the purchase price of the new equipment being purchased. For example: the allowance on a machine one to 12 months old is 55 per cent, 30 per cent for one 37 to 48 months old, and only 5 per cent when the machine is 73 to 84 months old.

A purchaser of IBM machine equipment may arrange for maintenance service by: (a) entering into a maintenance agreement contract with IBM, (b) obtaining repair and maintenance service from IBM on a time-and-material basis, (c) servicing own equipment, or (d) utilizing the services of any other maintenance organization.

Monthly maintenance charges—which can be obtained upon request from IBM—for each machine are for machines used by a single daytime shift of clerks on a workweek of not more than 40 hours, Monday through Friday, and for IBM's normal working hours. If a workweek is in excess of 40 hours, monthly maintenance charges in general will be billed at 5 per cent of the monthly maintenance charge for each two hours exceeding 40.

(8) ACCUMULATED RENT	(9) PURCHASE PRICE + INTEREST+ IBM MAINTENANCE	(10) NET SAVINGS
-	$28,628	
$10,560	32,214	
21,120	35,777	
31,680	38,920	
42,240	41,624	$616**

TABLE I. **407 A 1 Accounting Machine** (5 years old)

Column 2: IBM price new $52,050 × 50% (for 5 year old machine) = $26,025 plus 10% excise tax $2,603 = $28,628.

Column 4: Col. (7) previous year − annual rent + annual maintenance current year; i.e. $28,628 − $10,560 + $2,121 = $20,189.

Column 5: Col. (4) current year + Col. (7) previous year ÷ 2; i.e., $20,189 + $28,628 ÷ 2 = $24,409.

Column 6: Col. (5) × 6%; i.e., $24,409 × 6% = $1,465.

Column 7: Col. (6) + Col. (4); i.e. $1,465 + $20,189 = $21,654.

In appraising the cost of maintenance service on purchased equipment it is considered necessary to accept IBM's monthly maintenance charges, in that no basis in fact exists for determining the cost or the caliber of alternative modes of repairing and maintaining such equipment. While IBM is opening a training school in Chicago (fees for the various courses may be obtained from IBM), it is doubtful that any but large users of punched card accounting equipment will wish to consider self-service on purchased equipment.

There is not only the cost and difficulty of training any one man on all types of IBM equipment—both present and future—but there is the related matter of coverage for vacations and illness, and the problem of replacement in event of turnover of experienced service engineers.

While service is available from IBM on a time-and-material basis, service on such a basis might well cost in excess of monthly maintenance charges, and might not be nearly as satisfactory as a maintenance contract. The alternative of using the services of any maintenance organization other than IBM cannot be considered at the present time since to the best of the writer's knowledge no such organization is in existence.

The following is a brief enumeration of some of the intangible considerations that must be weighed, to the extent appropriate, by any organization considering the purchase of punched card equipment:

1. First and foremost is the matter of technological obsolescence, or in other words what is the probability that in "x" years new machine equipment may be available to do the same job better or more efficiently? In particular what are the prospects that any one operation now utilizing punched card equipment may be adaptable, at an economic or other advantage, to the use of electronic data processing equipment? Consideration in this respect must also be given to the possibility that newer types of punched card equipment may be developed in the future to do the same job better than equipment now in use.

2. The business organization renting punched card equipment can change its operations so as to eliminate or use other types of punched card equipment without suffering the loss of an appreciable part of the capital investment in purchased equipment. The possibility of such changes in the future should be carefully weighed. In this respect it is particularly noted that it is unlikely that any outside market for used IBM equipment will develop unless a number of organizations purchase such equipment, and perhaps not even then. It is also noted that IBM accepts used purchased equipment only as a trade-in on new IBM

equipment, and that even the maximum trade-in allowances are far from liberal, and certainly inadequate for the recapture of capital investment on any realistic and acceptable basis of depreciation.

3. The allowance of 10 per cent per year for each year of age of used equipment is based on single shift usage, and no additional allowance is made for extra shift usage. Thus, if any given piece of machine equipment is five years old, and has been used on a double shift, in terms of wear and tear the machine could be considered as 10 years old, but only 50 per cent of the purchase price is being allowed as a discount. It could, of course, be argued that much of the wear and tear caused by double shift usage is offset by preventive maintenance including prompt replacement of worn parts.

An anomalous situation exists with respect to one of the most important factors bearing upon a decision to continue renting or to purchase used punched card equipment: namely, the probable life expectancy of such equipment. In the first place, as previously noted, used equipment is offered for sale by IBM at a discount of 10 per cent per year from the date of first installation, but not in excess of 75 per cent discount. However, this rate is considered unrealistic from the point of view of determining the probable life of the equipment, in view of the fact that such rate of discount is applied to the January 1, 1957 sales price. For example, it is highly improbable that the January 1, 1957 sales price is the same as the sales price a similar machine would have been on January 1, 1952 if the equipment had been for sale. Thus, any inference that the machine equipment has a 10-year life based on such rate of discount is probably erroneous.

On the other hand, the Engineering and Valuation Section of the Internal Revenue Service, considers that punched card equipment has an actual useful service life of from about 16 to 20 years; so that new equipment would probably carry a depreciable rate per year of 6.67 to 5 per cent.

TABLE II. **407 A 1 Accounting Machine** (5 years old)

(1) FUTURE AGE OF MACHINE	(2) PURCHASE PRICE	(3) ANNUAL RENT	(4) IBM ANNUAL MAINTENANCE	(5) ANNUAL RENT MINUS ANNUAL MAINTENANCE	(6) PV OF $1 MIDDLE OF YEAR	(7) (5)X(6)	(8) ACCUMULATION OF (7)
	$28,628						
6		$10,560	$2,121	$8,439	.97170	$8,200	$ 8,200
7		10,560	2,505	8,055	.91670	7,384	15,584
8		10,560	2,505	8,055	.86481	6,966	22,550
9		10,560	2,505	8,055	.81586	6,572	29,122

Column 2: IBM purchase price new $52,050 × 50% (for 5 year old machine) = $26,025 plus 10% excise tax $2,603 = $28,628.

Column 6: Present value of 1 at mid-point of year (by interpolation).

Column 8: It is evident by inspection that accumulated present value of annual rental less annual maintenance that the break-even point with respect to purchase price lies between the 8th and 9th years. By interpolation ($28,628 − $22,550 ÷ $29,122 − $22,550 = .92; 12 months × .92 = 11 months) 8 years, 11 months, less the age of the machine on date of purchase is 3 years, 11 months.

Extra shift usage of such equipment would not ordinarily permit an increase in rates of depreciation over those stated because of the assumed nature of the type of maintenance. In any event, it appears that the burden of proving accelerated depreciation or a higher rate than stated above would be on the taxpayer. If a five-year old machine were purchased it appears that the purchase price could be depreciated over 11 to 15 years.

Notwithstanding the foregoing the actual cost of purchasing new or used punched card accounting equipment can be projected for only nine or 12 years, as the case may be, in view of the fact that maintenance service is available mostly for only nine years from the date of first installation of machine equipment, although maintenance service is available on a contract basis for 12 years for certain types of equipment. Thus, if a machine is five years old and a maintenance contract can be obtained only for nine years for a similar new machine, then such used equipment will be serviced on a contract basis only for another four years. While maintenance service contract costs are firm as of today, there is no assurance that the cost of such service will not increase in the future.

As a practical matter, then, cost comparisons as between continued rental of punched card equipment versus purchase plus IBM maintenance of such equipment can be made for only nine or 12 years, as the case may be, less the age of used equipment.

It is believed that any business organization considering the purchase versus rental of IBM equipment should formulate a definite financial policy with respect to the return that it expects to obtain on any capital investment project. Irrespective of whether or not there is a limited supply of funds for investment in capital projects, the relative merits of any one project against another can best be measured in terms of the return on investment concept. Such a rate of return at any one time may vary widely in terms of the nature of a business organization; and might range from a low of 5 or 6 per cent for a bank or insurance company, to 20 per cent or more for an industrial organization (one industrial organization is known to have established a 20 per cent return on investment before taxes as the minimum rate).

For any punched card machine less than nine years of age (12 years if maintenance contract can be obtained for such equipment), it is possible to compute the number of years and months that must elapse until the cost of purchase plus IBM maintenance is equal to the cost of continued rental of such equipment, and such point is commonly referred to as a "break-even" point.

Having determined the desired gross rate of return on investment, one relatively simple way of computing the break-even point is to assume that the purchase price of the machine equipment was borrowed at such rate of interest. The amount borrowed (i.e., the purchase price of the machine is then amortized by the differential between the rent that would otherwise have been paid, and cost of maintenance service plus interest expense. Purchase price plus interest expense plus IBM maintenance is then accumulated, and compared with the accumulated rental expense if the machine had been rented. Where the two sets of figures correspond will indicate the number of years and months that must elapse to arrive at the break-even point. While such computation is relatively simple in principle it is arithmetically rather time-consuming. An example of this computation for a five-year old 407-A1 accounting machine is shown in Table I, it being assumed that 6 per cent is the desired return on investment.

A somewhat simpler method is to compute the present value of rental less

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What are the factors to consider
before any procedure change is undertaken?

The Computer in Commercial D

Paper read at High Speed Computer Conference 1956 at Louisiana State University.

► A basic change in data processing procedures has been occasioned by the very nature of the new electronic computers. To begin with, the electric accounting machines with which we all were familiar were constructed in such a manner that most of the logic was built into the equipment, whereas with electronic machines the logic is not built into the machine but must be created by the systems man, then stored in the electronic memory as a basis for the successful operation and utilization of the computer.

This is a relatively simple fact but as is quite often the case it has taken a lot of hard work and concentrated research to appreciate it. Therefore, this discussion will cover some specifics based on my personal experience in the development of computer applications in connection with existing data-processing problems of C. I. T. Financial Corporation and its numerous subsidiary companies.

E. G. Benser is responsible for methods work, involving research and development of electronic data processing applications in the fields of factoring, automotive financing and insurance for C.I.T. Financial Corp. and its subsidiaries. He also is the administrative head of all tabulating operations.

Basically C.I.T. covers a widely diversified field including three areas which involve the handling of enormous quantities of records pertaining to unit transactions. These areas are in the fields of factoring, automotive financing and insurance.

To properly record the end consolidated result of these varied business fields we process through a central tabulating department an average of 40,000 individual transactions per day. On the other hand, exclusive of our factoring operations, the source records relating to instalment financing and insurance records have historically been processed on a completely decentralized basis. For example, at the present time the Universal C.I.T. Credit Corporation operates through more than 445 branch offices located throughout the United States, and our Service Insurance activities are handled through 14 Insurance Underwriting and Policywriting Offices, 24 Insurance Claim Offices, with an intermediate consolidation through 7 Regional Accounting Division Offices.

We have established a central Methods Department for the specific purpose of dealing with the possible utilization of electronic data-processing equipment in connection with any record keeping function of any subsidiary company wherein possible economies may be indicated.

by E. G. Benser

Data Processing

It is important to emphasize that in our company the primary consideration in any procedure change is *cost reduction*. Unless the change results in dollar savings which can be accomplished without any reduction in the present standard of service we will not undertake the project.

In our approach to any computer application, after having determined that the area of cost reduction and improved service exists, we consider the company-wide elements that are involved in recording and processing operations.

We do not separate these two basic steps in the development of a system. Our concept of electronic data-processing is the combined consideration of these two areas:

(1) Consolidated Recording—the creation of a consolidated record which can be handled only by a computer.

(2) Automation—representing the automatic flow from consolidated recording through the various processing steps.

In the development of a consolidated record we sought a method whereby we could collect in common-language form, as a by-product of existing operations, all of the information required for any subsequent purpose in connection with either or both our instalment and insurance activities.

The need for such a device was recognized more than ten years ago by executives of C.I.T. Financial Corp. but it was not until about one year ago that we were able to obtain such equipment engineered to our specifications.

We are in process of installing IBM type 884 Typewriter-to-Tape machines. We have designed a form representing a consolidated record which, when typed on this equipment, produces an original insurance policy and as a by-product thereof records in eight-channel paper tape all elements of information regarding both the instalment and the insurance sides of the transaction. This paper tape contains the information for each transaction that normally would be punched into as many as sixteen 80-column tabulating cards and provides the basis for handling through a computer in one run all of the consolidated information needed for every accounting and statistical purpose.

Computer Application. Having developed a consolidated record we were ready to complete the process of automation through use of an electronic computer.

In our studies we soon discovered that for the most part business recording involved posting or, in other words, the entry of single items to individual records. This means that large memory is not of primary importance in our automatic data-processing. What is needed is reasonably fast access and reasonably rapid output. Accordingly, this led us to a study of the possible utilization of the so-called small-scale digital computers. This approach has certain advantages, as follows:

A. Lower cost permitting multiple installations, thereby preserving the decentralized method operation.

B. Flexibility represented by multiple uses of the computer by virtue of having more than one installation at convenient points.

In our experience we have found that there are certain practical considerations that enter into the development of a system involving the application of a high speed computer to ordinary commercial data-processing operations.

Continued

1. Is a competent systems staff available?

It is my opinion that unless such a staff is available there is absolutely no use in trying to determine the advisability of moving into the field of electronic data-processing. By a competent systems staff I mean that you must have available men of sufficiently high caliber to not only grasp the broad management viewpoint but also to be capable of developing the new system by complete programming from flow chart to machine code.

2. What will the study cost—and are you prepared to invest the money?

Usually the cost will be based on executive determination as to the scope of the study, coupled with an estimate of the length of time in which the study must be completed. It is not an uncommon thing to expend five or ten man-years of effort in such a study.

The number of man-years required is closely related to the existing system. For example, if the present system is fully mechanized, especially through the use of punched card routines, it may reduce the amount of time required by 50% or 60%. This is because most of the details involved in the proposed system have already been defined and quite probably written in a form whereby further investigation is not required. In fact, during the study a decision may be made to proceed with an intermediate mechanization step before jumping into the high speed computer application. Quite often this represents a distinct advantage because mechanization on ordinary tabulating equipment of an existing manual method will help in subsequent computer programming by pinning down the individual procedural steps.

Be prepared to invest more in this study than has ever been invested before in any similar enterprise. It is generally accepted that the study will pay dividends in one way or another regardless of whether or not you decide to install a computer. Usually, enough facts are obtained in the course of such a study to develop many immediate areas of cost reduction not necessarily dependent upon the use of a computer.

3. Is management prepared to accept a new concept in record keeping?

Automation has come into being because of the willingness and the foresightedness and the imagination of individuals who were willing to accept entirely new concepts in order to accomplish definite progress.

There is little relationship today between the modern automatic factory and the hand processes previously used. We must be prepared and willing to perform the same kind of surgical operation on paperwork as has been done on manufacturing processes if we expect to bring our cost down to a reasonable basis. Some people think a posted visible ledger is essential and will be very hard to convince that the same information is as readily accessible when it is stored on a magnetic tape.

4. What will the new system accomplish?

The first and most important business objective is the increase of profits through reduction in related paper processing costs. As far as I am concerned all other considerations are secondary. The fact that the system will process your paperwork more rapidly, or will produce additional statistical information, or will create fancier or more attractive records, or has advertising value, or any one of hundreds of additional possible advantages, are not basic considerations.

The desirable objectives may be sum-

marized as follows:

A. Will the system reduce costs?
B. Will it produce all required information at the time and in the form desired?
C. Is it flexible, so that sudden changes in company operations can be incorporated with minimum effort?
D. Does it provide a sound basis for future expansion and continued improvement?

5. *On what basis will the hardware be selected?*

The selection of the proper type of equipment should be based on the study of the equipment's ability to handle *all* of the proposed applications. I have emphasized the word "*all*" because of the nature of these new digital computers.

For example, the hardware requirements for a payroll application may be entirely different from those indicated for an insurance reserve calculation. Therefore, it is not wise to make a decision on the selection of equipment until the basic elements of the proposed system have been fairly well defined and are ready for machine programming. This will permit you to make a good comparison as to the relative effectiveness of competitive equipment in relation to your specific applications.

Following are some of the considerations which we have found to be of primary importance in reaching a decision as to the type of computer to be used.

A. *Size of Computer.* It is important for economic reasons to determine as quickly as possible the relative size of equipment that must be considered. Unless this is determined you are not in a position to weigh the relative merits of competitive equipment.

I am speaking here only of the medium and large size general purpose digital computers. Basically the main difference between medium and large size computers is one of cost and capacity. Therefore, it should not be difficult to arrive at a decision in regard to your particular application.

B. *Speed, Versatility and Reliability.* It is my opinion that having determined, on the basis of cost and capacity, the size of computer that should be considered, all other important considerations are related to the elements of speed, versatility and reliability.

The question is, how can the potential user exercise independent judgment in arriving at a decision in the face of so many conflicting and sometimes misleading statements that are made regarding the relative abilities of various computers? We have found it helpful to start on the basis that all computers will perform exactly as indicated by the manufacturer and accept as fact all of the technical specifications regarding operation of the equipment.

Then it becomes necessary for the user to intelligently relate these technical specifications to the particular application at hand. This involves taking a look at each competitive piece of equipment on somewhat the following basis:

(1) Speed of the computer should be judged in relation to the entire system or application. Can the job be done in the required time?

While speed is a primary consideration in the selection of a computer, it becomes important only if it is utilized to the best advantage in meeting the requirements of your proposed system.

The ultra-high-speed computer is not always practicable in a system which cannot supply input or process the output at sufficient rate to keep the computer fully utilized.

(2) The computer should be versatile enough to accept a variety of input media and provide output at a speed

Continued

consistent with the system as a whole.

In particular, a minimum amount of conversion of data from one media to another is desirable. Accordingly, if your system provides for a consolidated record produced in a form that is acceptable to the computer without intermediate conversion, you have probably reached the maximum set of conditions. Unfortunately, this is extremely difficult to accomplish, primarily because of the difficulties encountered in arranging the source media at the time of initial recording in a form which is economically suitable for operations within the computer.

For that reason our experience has resulted in the selection of punched paper tape as the medium for recording our consolidated record at the source. The information thus recorded can, through the use of auxiliary equipment, be readily converted into punched cards. The punched cards provide a medium whereby inexpensive auxiliary equipment can be used to sort and arrange the input media in a manner which will facilitate computer processing. The same reasoning must be applied to the utilization of output media.

(3) The various input and output devices which may be used must be examined to insure that the speed and capacity of each such device is compatible with every other in the proposed applications. For example, in a particular application we are storing on magnetic tape an account history in a 600-character record grouping. Our input record, in the form of punched cards, is confined to an 80-character grouping.

Although the speed of the two input devices used, i.e., magnetic tape reader and card reader, varies considerably they are compatible in this particular system because of the ratios represented by the different size of each record coupled with the fact that we will apply only one 80-character record to every fourth 600-character record.

(4) It is usually important that the computer provide for transfer of data between input and output which does not involve storage needed for memory, arithmetic or control purposes. This may be accomplished by means of a high speed magnetic core storage unit which will receive and transfer this type of information without going in and out of the main memory unit. The availability of this feature in connection with our system has resulted in reducing the computer processing time almost 75%.

(5) The computer must be sufficiently flexible to permit the attachment as required of additional input or output devices. Furthermore, it is highly desirable that the input-output devices be susceptible of low cost field modification in order to handle specific applications. In our case we have not yet been able to utilize a high speed printer in connection with a medium size computer because of the difficulties encountered in preparing the data in a form suitable for processing through the existing high speed printer.

Also, in a specific application, we could reduce our computer time considerably if it were possible to obtain a dual feed carriage on a synchronized electro-mechanical printer.

(6) The computer should have adequate buffer storage to provide for overlapping between input and output. This is extremely important and will have a distinct bearing on the computer time required for any specific application.

(7) The computer's ability to handle alphabetic information may be important to your specific application. Today

there are many limiting factors in the processing of alphabetic data.

(8) Ease of programming is extremely important. This is a time-consuming operation which can materially increase your costs.

(9) Reliability as represented by maximum accuracy and minimum downtime is a valid consideration in the selection of a computer. Most computers provide some form of self-checking validity checks. The best yardstick that can be applied in measuring these factors is by obtaining information as to the experience that has already been gained by others in the use of the equipment.

6. *What are the Installation problems?*

It is suggested that complete decision be reached in advance of the delivery of any computer as to exactly what the installation schedule will be. I will enumerate some of the important matters that must be settled and set forth in detail in your installation schedule.

A. Selection and Training of Personnel. The right people in adequate numbers must be selected and trained during the pre-installation period. This will include programmers, operators, supervisors and so forth. Training schedules must be accurately timed so that the installation schedule will not be impaired.

B. Program Testing. All programs should be tested prior to installation. It is often possible, through facilities provided by most manufacturers, to debug the programs on the selected equipment before it is installed.

C. Physical Installation—involves a consideration of space, power and air conditioning requirements. In some cases relocation of existing equipment must be provided for.

D. Conversion of Existing Records. In any large-volume operation you must face the problem of deciding whether to convert the existing records or to permit them to continue under the old system with only current records being placed on the new system. Your decision will depend entirely on the type of application you are concerned with.

7. *In what form will permanent company records be maintained under the new system?*

In the application of a computer to daily commercial data-processing operations it is easy to lose sight of the importance of permanent records needed for legal and historical purposes.

Let us assume that your new system involves the storage of information on magnetic tapes. Perhaps you have solved all of your daily or current record keeping problems. You know how to find information for the purpose of applying cash or recording new transactions, etc. and you will continue this processing, building up and accumulating information on various magnetic tapes.

What happens when the transaction is completed? Do you intend to leave the record on tape wherever it happened to be at the time it was last processed, or is it essential and necessary that the history of the transaction be extracted and recorded in some other more convenient form?

If you decide that the magnetic tape record is adequate, are you going to be able to find it, or will it be necessary to relocate the information in more accessible arrangement? These questions are extremely important to any business enterprise.

There are many statutory requirements governing the maintenance for specific periods of historical records for a variety of purposes. You must consider these prob-

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Shop talk: "The Big Show"

by Leslie Matthies

► Wherever men get together to make an organized effort, they always have one big job.

This is the one job that marches straight to the big objective—straight to the *real reason* for the very existence of the organization. It is the job that most of the people work on.

Some people say, "But all objectives of organized effort can be summed up in one statement—to make a profit."

However, profit making is a *common* objective. The Big Show we are talking about here is not profit. It is the main effort of the organization, which, of course, finally results in achieving a profit.

To various degrees, most people lose sight of this major objective.

Just what do we mean by this big show?

Let's consider some examples:

Look at the organization that we call a church. Why do you organize a church? What is its basic purpose? To conduct services? To build a structure to house the congregation? To organize social clubs? Women's clubs? Is the purpose of the church to put on a tasty pot luck supper? Sponsor a softball team?

None of these things are the big show of the church. These are all "peripheral" activities. They are support activities—they mill around, out near the edges.

The big show of the church is *spiritual advancement*—the bringing of the individual man closer to God.

All other activities, those that are not the actual big show, should support the big show. If they *do not* render relatively direct support to the functions of the big show, you should get rid of them.

Support activities should make it possible for the big show to function; should make it possible for the men *who can* run the big show, to run it. Strip away the confusion. Make support activities do a support job. Let the main-line effort—the big show—go at the big job with hammer and tongs.

Let's take another example: This time let's consider an industrial concern. This is an outfit noted for the excellence of its engineering designs. It has a factory, too; it has a personnel department; it has an accounting department, but none of these is the big show—engineering is.

Other functions are support activities to engineering. These other activities make it possible for engineering to produce ideas that can be built, in the factory, into a tangible product—a product that can be sold to a customer. Engineering, in this organization, is the big show, while the other activities are side shows.

Consider still another industry: This next company doesn't have an engineering department. Rather, it produces job-shop work, work made to each customer's specifications. Shop activities are the big show.

All other activities—such as personnel, payroll, plant protection, purchasing, ac-

counting, systems, liaison engineering, and central files—all these are merely contributors to the big show.

You may say, "Don't most people know this? Certainly they *know* what the big show is in their own organization!"

Well, most people are *supposed* to know. The truth is they seldom do! They forget.

The big show concept is important because it's too easy to lose sight of the major objective in any organization.

The big show concept can help us get back into mental balance. It's too easy to consider accounting, or personnel work, or systems, as an end in itself.

Here's what happens every day—in every organization—people get off on tangents. They forget what they are really there for. When people focus on the wrong thing the organization picture becomes distorted.

We lose perspective. We focus on support activities, and we begin to think and act as if they are "ends" in themselves. Personnel work, or accounting, are contributors to the big show of the organization, seldom true objectives in themselves.

Let's take a look at still another organization example:

This time consider an employment agency. Here personnel work *becomes* the big show. Now correspondence, filing, accounting, and advertising activities become contributors—supporting activities.

Always—in churches, in industry, in banks, in business—the big show will be able to do an outstanding job—if the supporting agencies are organized *as supports*, and *not as ends* in themselves.

If the big show is allowed to concentrate on its major objective, uncluttered with supporting services, it will be able to get up a full head of steam and apply it to its own important work! Thus the entire organization will benefit!

Supporting services should never be sandwiched in with the big show. They should be placed under another jurisdiction.

If we are about to make a decision on a question involving a supporting service, we should always first ask:

"Which, of several alternate solutions to this support service, contributes most directly to the success of *our* big show?" **s/p/a**

Commercial DP

Continued from Page 35

lems in connection with the development of your new system which utilizes these modern record forms.

Summary

In summarizing it might be said that there is no magic wand that can be used to produce the desired results. The job is becoming more exacting every day. It has been our experience that initial programming generally produces only about 50% relative efficiency whereas subsequent study and re-programming may reduce the operation to an economical base.

In one application we were able to cut the computer time in half by re-programming the operation. As we have gained experience in programming we have begun to learn how to obtain maximum efficiency. Our first experience was with the Card Programmed Calculator. Our second experience was in programming factoring accounts receivable on the 702 and later on the 705. We now are engaged in similar programming of some of the same operations on the IBM 650. Each step has shown the way to increased efficiency and reduced costs.

We feel that time is of the essence and that those who sit back and wait for further developments will find that they are seriously handicapped in taking advantage of them when they arrive. Use what is available on the market as quickly as possible and you will be in a position to change over and improve as rapidly as new devices become available. **s/p/a**

S&P
Book Reviews

Computers, Their Operation and Applications, *by Edmund C. Berkeley and Lawrence Wainwright, Reinhold Publishing Corp., 430 Park Avenue, New York, 366 pp., $8.00.*

This book is intended to up-date and expand on Mr. Berkeley's 1949 work, "Giant Brains, or Machines That Think," one of the pioneering books in the computer field. Like its predecessor, this work contains a good general statement of the principles underlying the high-speed processing of information and a broad description of how computers function.

In addition it makes available information not readily accessible elsewhere on the subjects of analog computers and miniature computers,—the latter an area in which Mr. Berkeley has performed an outstanding educational service over a period of years during which time he has developed and sold miniature computer kits and instructional literature. This writing should serve as an excellent kick-off point for anyone seriously interested in learning the technicalities of computer operations. It is interesting to note that the build-it-yourself electronic moron, Simon, (named after his simple nursery rhyme counterpart and first described in "Giant Brains"), has grown to formidable mental stature in this latest description.

The section on analog computers, the work of Mr. Wainwright, is a thorough and detailed presentation of the functions, operations and applications of these machines and should constitute an excellent lay orientation in this area. Of particular interest here is the tie-in with digital computing equipment which the author stresses.

Office Management, *by Charles B. Hicks and Irene Place, Allyn & Bacon, 70 Fifth Avenue, New York, 548 pp., 1956, $8.65.*

A thorough and detailed discussion of the entire field of office management, this book presents both principles and practical applications in specific terms. 26 chapters make up the six sections into which the book is divided: Management and the Office, Planning and Organization, Control or Office Work, Work Simplification, The Human Element, and Management and Supervision. While the book is primarily a commendable contribution to the educational field where teaching of office management subjects is seriously hampered by the lack of adequate texts, it will serve as an excellent reference work of wide scope for systems personnel.

Faster, Faster, *A Simple Description of a Giant Electronic Calculator and the Problems it Solves, McGraw-Hill Book Company, 330 West 42nd St., New York, 160 pp., $3.75.*

This monograph is a straightforward and uncluttered explanation of the inner workings and capabilities of one particular, exceptionally large computer, the NORC (for Naval Ordnance Research Calculator), built through the joint efforts of IBM and the Watson Scientific Computing Laboratory of Columbia University for the Navy Bureau of Ordnance. It is written in a manner easily understandable by the person without previous orientation, and yet the presentation adheres closely to technical facts in a manner which should make pleasant reading for the most experienced.

Along with chapters devoted to machine operation, instruction, maintenance, and description of the various machine components (some of which are unique in the electronic data processing field), the book contains two chapters which are of unusual interest. One chapter titled "Plain and Fancy Arithmetic" presents an excellent explanation of the manner in which the machine performs the four arithmetic functions. Another chapter, "What is There to Calculate", is a mature yet understandable discussion of scientific and mathematical problems of the type on which large-scale computation equipment is generally employed. The non-mathematical reader will gain from this chapter a new understanding of the practical value of high-speed computation equipment.

Information for Administrators, *by Paul Wasserman, Cornell University Press, 124 Roverts Place, Ithaca, N. Y., 375 pp., $6.00.*

This book should aid the analysts, research people and management personnel who seek capsule type information on reference books, statistical services, research organizations, trade associations, and publications in public administrations. It also includes chapters on "Government as a Source of Information" and "Sources of Legislative and Regulatory Data".

It is essentially a reference guide which may be very handy when one seeks information on a particular service, publication or subject related to public administration. There are seven appendicis covering such subjects as "Lists of Depository Libraries", and "Information Sources on Foreign Countries".

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Purchase vs. Rental of IBM Equipment

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maintenance charges on a year-by-year basis (greater accuracy could be achieved on a monthly basis, but not enough greater to justify the additional work involved), and to accumulate such present values year by year. Such computation should be continued until the accumulated value is in excess of the purchase price, at which point the break-even point may be determined by interpolation. An example of this computation is set forth in Table II for a five-year old 407-A1 accounting machine at 6 per cent return on investment.

It is noted that it takes longer to reach the break-even point on machine equipment as the rate of return increases, and that it may be necessary in some computations to estimate maintenance costs. Data in Tables I and II include 10 per cent excise tax (6 per cent on purchase price of new machines, 10 per cent on purchase price of used machines and all rentals). Sales and other taxes should be included in computations, if they obtain.

Conclusions

1. **Intangible considerations** of purchase versus rental of IBM punched card equipment must be carefully evaluated by management.

2. **Break-even points** can be determined only after financial management has established a satisfactory gross rate of return on investment.

3. **Effect of purchase** versus rental on net income after taxes should be taken into consideration. **s/p/a**

An editorial

Another Dimension

► Those who went to Philadelphia in October to attend SPA's 1956 International Systems Meeting had a chance to hear the experts tell how it's done, to rub elbows with colleagues from distant parts, and to get away from the home office routine for a few days. All of these things have their worthwhile aspects.

The panel of speakers and seminar leaders lined up by Chairman Joseph A. MacQueen and his hard-working committeemen put on a varied program that was well integrated with the conference theme: People plus Systems equal Profits. Echoes of this program will continue to reverberate throughout the systems field for many months—and these echoes will receive a sort of booster shot by the forthcoming publication of "Ideas for Management" embodying the best of the seminar and general sessions presentations.

However, some of the best things that happened in Philadelphia will not show up in this remarkable volume. It won't be able to capture the camaraderie engendered by the coming together of 1,500 systems people—all interested in meeting and exchanging ideas, talking a universal systems argot with distant colleagues, and enjoying the informality of lunching, banqueting and seeing the town together.

While the general sessions and seminars dealt for the most part with down-to-earth, utilitarian systems techniques, a higher view of the purpose of systems as a field of human endeavor was touched on by the clergyman who gave the invocation on the morning of the first day of the meeting and again by Harold C. Stott in his closing address.

These two men, from different walks of life, helped to remind the conferees that the everyday give-and-take of life in today's business world can enrich our lives but meagerly if we lose touch with fundamental human and spiritual values. By putting the whole of American industrial effort into its proper relationship with the political, social and intellectual cosmos within which it operates, Mr. Stott's brilliant address added another dimension to the thinking of his listeners.

Most of us have discovered that if we lose sight of fundamental considerations in our efforts to solve business problems, the value of our work is weakened, our solutions are off-target, we feel a sense of dissatisfaction with our accomplishments. To restore validity to our actions we must get back in touch with the fundamentals of the problem at hand. In the same way our whole mission in our chosen calling in life loses validity and leads to feelings of frustration if we neglect to place our day-to-day efforts in a proper relationship with the more durable values of our enlightened civilization. The systems man along with other business people must add this other dimension to his thinking if he is to make a lasting contribution to human progress and to his own happiness. **s/p/a**

THE EDITORS

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